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ABSTRACT

This study investigated the writing habits of seven professionals who regularly use word processing to compose texts at work. The aim of the investigation was to get some idea of the variation to be found in how these writers use word processing to compose longer texts (four pages or more). Subjects noted advantages of word processing, such as the ability to work on a text for short periods of time and the ability to compose text in a nonlinear fashion. Implications for the writing process of computer-adapted composing strategies include a decrease in planning activities associated with writing and changes in the process of achieving text coherence. (JP)

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Composing on the computer: a study of writing habits on the job

ELEANOR WIKBORG

Abstract

This interview investigation of the writing habits of 7 subjects focusses on the non-professional writer, that is on the writer who regularly uses word processing to compose texts at work, but who does so as only one of several other equally important tasks. The aim of the investigation is to get some idea of the variation to be found in how these writers use word processing to compose longer texts (4 pages or more).

After describing the research methodology, this paper reports on what I perceive as the changes in my subjects' writing habits that have come about as a result of their adaptation to the conditions of working with a word processor. It then goes on to discuss two ways in which the technology appears to be affecting the writing process, namely, the ways writers go about planning their texts when they have access to a word processor, and the ways they go about achieving coherence in their texts.

1. Introduction

This study is one of several being carried out in the project "Computer Based Writing" at the Computing Science Department at Stockholm's Royal Institute of Technology (RIT). Other studies within the project led and initiated by Kerstin Severinson-Eklundh are: a survey of word processor users at RIT (1987, 1989b), a program which simulates the paper metaphor on screen (Englund, forthcoming), two case studies of how people use outlining programs (1989a and this volume) and the design of two keystroke recording programs, i.e. programs that register every command that a user executes while writing a text.

My study of the writing habits of people who use word processing to compose texts on the job is a follow-up of the survey of 70 word processor users at RIT mentioned above. The purpose of the survey was first, to identify these users' perception of their writing habits on the computer, and second, in a follow-up questionnaire, to see if these perceptions had changed over a period of two and a half years.

The aim of my own in-depth study of a far smaller group of writers is to get some idea of the variation of be found in the way writers use word processing to compose longer texts at work (4 pages or more). The ultimate aim of the study, as of all our studies, is to work out the ways in which computer support can be better adapted to writers' needs.

Where most studies of the effects of word processing on writing habits have focussed on students or on professional authors, my focus has been on the writer who regularly composes texts at work, but does so as only one of several other equally

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important tasks. I am now nearing the completion of an in-depth study of the writing habits of 7 subjects whose professions are: an engineer, an administrator, an economist, a psychologist, a union public relations officer and two computer scientists in the communications industry.

The investigation was carried out as follows: The subjects filled in the same, slightly expanded questionnaire which was developed for the RIT survey (Severinson Eklundh and Sjöholm, 1987). The questions are designed to elicit descriptions of how writers go about planning, developing and revising their texts, both with and without word processing. On the basis of their replies, I then asked my subjects to describe their writing habits in greater detail in an interview, and in most cases I was also given an example of their texts to analyse.

I had aimed at studying several versions of one text per subject, but it did not prove possible in all cases actually to get hold of different versions. This is the most unsatisfactory part of the study so far, and we hope it will be remedied in future work. Two of the subjects have actually offered to submit to writing with a key-stroke recording program, which means that we will have access to every single move they make in the process of creating a text. The findings of this paper are thus based more on what my subjects have told me about what they do, than what they actually do.

This study focuses on what I perceive as the changes in my subjects' writing habits that have come about as a result of their adaptation to the conditions of working with a word processor. This then is what 7 non-professional, but, as it turned out, highly self-aware writers, have told me about how they have adapted their composing strategies to the advantages and disadvantages of their particular word processing programs.

2. How writers adapt their composing strategies to word processing conditions

2.1. *Fuller note-taking*

The ease of writing and storing texts has inspired three of my subjects to make fuller records of various work activities. In addition to serving as records, these texts are also perceived as forming the potential raw material of future texts.

One subject reports that where he used merely to record the decisions arrived at in a meeting, he now also writes notes on the discussion that led to the decisions. Another describes how, for example, when a sales strategy is discussed on the communications network, this discussion is stored in the computer memory, thereby creating a kind of work-book of the various suggestions and views that were aired. Yet another, a psychologist, uses Apple's Hyper Card to make notes of what people tell him about

their research, organising them by means of Hyper Card's nodes and links. He reports that this structuring work helps him assimilate the material, in what he calls "a process of self-instruction" (Swedish: "ett själv-pedagogiskt arbete"). He also uses ordinary word processing on a lap-top to take notes at conferences, which he stores in his Macintosh.

All these various types of notes are seen as the possible raw material for future texts.

2.2. *Writing in short spells*

3 of my subjects mention being able to work on a text for short periods of time as one of the advantages of word processing. Their situation at work means that their writing sessions are frequently interrupted by demands on their attention and so, they say, it is heartening to discover when one returns to the screen that one has already produced some form of recognizable text. One of the subjects, an engineeer, commented that word processing in this respect supported his and, according to him, many other engineers' habit of dividing the text up into very short passages governed by a host of headings and subheadings. (For an example of a text written by this subject, see Wikborg, 1989.)

2.3. *Jumping around in one's text*

Another advantage these subjects mention is that both the computer condition itself and the habit of writing in spells frees them from the requirement that they compose their text linearly, i.e. that they start at the beginning of their text and gradually work their way to the end. Writing linearly means that you construct your text by steadily adding paragraph to paragraph, one by one, like beads on a string - a process that requires relatively long periods of concentration. My three subjects appreciated the way word processing enabled them to jump around in their texts, to work a bit on one section and then again a bit on another. They also find it useful to skip from one section to another if they decide an idea fits better there.

2.4. *The use of outlining facilities*

Only 2 of the 7 subjects were interested in using outlining programs. These programs were used for structuring, but equally important, the outlining facility was seen as a way of gaining perspective on the main ideas of the text. One of the subjects reported that he checks coherence by looking at the headings of only one level at a

time . Another describes how, when he is writing, he may get an idea and will decide "Oh, I've got to include that somewhere." In a long piece, the relevant spot can be difficult to locate, so he switches to Word's Outline mode, and scans the chapter and section headings to locate and then open the section into which the idea will fit.

2.5. *The use of windows on the screen*

On paper you can compare several texts by spreading the pages out on your desk. Two of the subjects had access to programs that will divide the screen into two or more windows, and they used this facility for the same purpose, i.e. to scan texts in another file in search of bits of text they wanted to incorporate into the new one.

They did not, however, report using windows to compare different parts of the same text. Going back and reading what one has just written is an important part of the process of developing the main line of argument in a longer text, but perhaps writers feel this is best done on paper.

3. Implications for the writing process of computer-adapted composing strategies

In the way word processing facilitates some writers' need to work on a text in short spells, as well as the practice of skipping about in the text to work first on one part and then another (Sections 2 and 3 above), we see an example of the way the technology might be shaping some writing styles. To date there are at least two other ways in which the tool appears to be affecting the writing process. One is the way writers go about planning their texts when they have access to a word processor, and the other is the way they go about achieving coherence in their texts.

3.1. *A decrease in planning activities*

Research in the U.S. comparing the use of pen and paper with word processing has indicated that in the latter condition both apprentice and experienced writers tend to plan less before they start writing their texts (Bridwell et al.,1987; Haas 1989a). The American research has identified three possible factors which may inhibit planning on-line.

Some studies report, first, that both student and experienced writers are lured by the screen into focusing their revisions on the word and sentence level. As a result attention is distracted from consideration of the main points of the piece (Collier, 1983, Case, 1985, Bridwell et al., 1987). Second, there is no computer support for the note-taking, scribbling and diagrams which many writers use to plan their thoughts.

And third, studies of reading on screen have shown it to be slower than on paper. Moreover, the time consumed by locating the specific piece of text you are looking for in a longer text by scrolling on screen further inhibits that process of constantly rereading or "rehearsing" a longer text which is so crucial to the process of creating a sustained argument (Haas and Hayes, 1986).

Of my 7 subjects, 2 report never feeling the need to plan what they are going to say before actually starting to write the text itself. The other five plan in varying degrees and ways - 2 report working out the main headings of longer papers before starting to write, while the other three report using diagrams or lists to plan for a range of 10-50% of the texts they write. This means that even those who do like to plan out some texts, produce a large number of texts which are not pre-planned. All seven subjects refer to the ease of adding and moving pieces of text as factors which make planning (in the sense of rearranging the order of their ideas) on the computer so much easier than it was on the typewriter. As for planning on the local level, one of my subjects reported feeling overjoyed that he no longer had to plan a whole paragraph before actually writing it. Working on paper required so much more discipline, he said, whereas on screen, as he put it, "it's the ability to hop [around in the text] that is so nice".

Two of my subjects who used to plan on paper before starting to write report doing so less now. That their report reflects a more general decline in the use of paper for planning emerges in the Severinson Eklundh and Sjöholm study in which the same 65-odd subjects were interviewed twice - once in 1985 and again in 1988. The percentage of those who reported using no manuscript whatsoever, not even keywords or headings, increased in those three years from 33% to 49%.

Three of my subjects - all of whom are planners - noted that they did virtually all of their planning on screen. As one of them put it "I used to have lots of hand-written notes before sitting down to the typewriter. Now I never do that." Two other subjects said they only planned longer texts on paper.

Such findings suggest that word processing is changing the nature of planning: my subjects describe how they "feel their way" towards the formulation of their main ideas, towards the structure of their text by means of constantly moving, cutting and adding bits of text. Of course the kind of writer who discovers what she/he wants to say by generating a lot of text - the so-called "discoverers" - have always felt their way into their text by first writing masses, and then salvaging some bits and jettisoning the rest. Still, the computer makes it possible to amalgamate planning and execution in a new way. By reducing the time lapse between planning, execution and revision, it would appear then to support the complex interaction between these

activities which cognitive psychologists, such as Flower and Hayes (1981) have described as natural to the writing process.

On the other hand there are those studies I mentioned which suggest that word processing leads instead to the inhibition of planning. The results are still inconclusive simply because it is particularly difficult under computer conditions to distinguish planning from execution and revision. Key-stroke recording programs, such as are being developed at our laboratory and elsewhere, will enable us to study every single operation by which writers compose their texts. Used in combination with think-aloud methods of observing how people write, we hope that in future studies, these programs will provide us with greater insight into how the planning, generation and development of ideas interact under word processing conditions.

One of my subjects has an interesting story to tell about his experiences of planning on the computer. He reports that he has tried to wean himself from what he sees as an addiction to working on screen. He used to spend up to 10 hours a day working on a text at the computer. He says, "It's so much fun to write that it's easy to get caught." He reports consciously trying to cure his habit by planning on paper before starting to write, a proceeding which was quite new to him. Now, he told me, instead of just starting to write and then attending to coherence later, he deliberately plans away from the word processor. He scribbles diagrams and ideas on paper, forgets about them, then sets about making new notes and arrows and boxes. He describes these activities as, in Swedish, en "mental bearbetning av ett material", a form of mental processing and preparation, and says, "I do more of this kind of work and put off the actual writing until everything is more worked out in my head". For one subject at least the fun of word processing was thus experienced as actually distracting to planning.

4.2. *Changes in the process of achieving text coherence*

Five of my subjects - even those who liked to do all their work on-line - reported a need to check the overall coherence of their texts on paper, at least in the final stages of their work. Many writers of longer pieces of expository prose (but by no means all) have commented on how difficult it is on a small screen to keep their main ideas firmly in mind - in other words, to achieve that global perspective which is so crucial to text coherence. It takes time on screen to scroll back to the place in your text that you need to reread in order to take that next step in the development of your thought, and when you have found it, you can no longer read the part you have just written. Most of us resort to paper print-outs at this point.

But the difficulty of getting what Christina Haas in her studies of this problem has called "a sense of the text" on the screen (1986, 1989b, forthcoming) has a direct effect on the writing process. The fact that writers cannot at the same time look at the paragraph they are working on on p 4 and the one that they need to reread on p 2 forces them to work in a different way. That is, they can no longer relate what they have just written to the main ideas of their text by an immediate comparison with what they wrote previously. Instead they must wait until they have scrolled back to the relevant passage, or until they can get a paper print-out. But scrolling back several screenfuls interrupts the thinking process, while waiting for a print-out means that the process of checking the text for global coherence is split off from the on-going development of the text.

The problem of gaining proper perspective on one's text on screen thus forces writers to delay the work of achieving global coherence until a later stage. This delay may make attention to coherence a more conscious process, which has its advantages. On the other hand, by interrupting, the delay may also inhibit some of the myriad of tiny unconscious steps by means of which writers work out and make coherent the governing propositions of their text. There is evidence to suggest that such is the case (Haas, forthcoming; Grow, 1988).

In the interests of text quality - especially of texts produced by untrained writers, of whom there are many struggling along in the workplace, it is important to find out what kind of composing decisions are in fact enhanced and what kind inhibited by word processing. Sondra Perl's research (1979) using the think-aloud method indicated that the unskilled writers working on paper may actually produce more text orally than they actually write down. Think-aloud protocols in combination with key-stroke recording of scrolling commands may be a way of discovering which, if any, composing ideas are never actually executed on the computer. Conversely, the same methodology may help us discover, for example, the degree to which the computer's ability to quickly move ideas from one section of a text to a distant, possibly more appropriate one, may be a means of facilitating the process of achieving text coherence.

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